

IN THE CLAIMS:

Claim 1 (Currently Amended) A method of forming a metallic silicide film comprising the steps of:

first exposing a substrate to a first flux of a Group IVB or VB metal precursor to form a condensed and absorbed monolayer or less of said metal precursor on a surface of the substrate; and

second exposing the condensed and absorbed monolayer or less to a second flux of a silicon source to provide a metal silicide film having a graded composition, wherein said first and second exposing is performed at a substrate temperature of less than 450°C.

Claim 2 (Original) The method of Claim 1 wherein the metal precursor is a halogen-containing Group IVB or VB compound of the formula MX_a wherein M is a Group IVB or VB metal, a is 4 or 5, and X is a halogen.

Claim 3 (Original) The method of Claim 1 wherein the metal precursor is $TaCl_5$.

Claim 4 (Original) The method of Claim 1 wherein the silicon source is a silane of the formula Si_nH_{2n+2} wherein n is from 1 to 10.

Claim 5 (Original) The method of Claim 4 wherein the silane is SiH_4 .

Claim 6 (Original) The method of Claim 1 further comprising introducing a hydrogen plasma to said substrate prior to said second exposing.

Claim 7 (Original) The method of Claim 1 further comprising introducing a hydrogen plasma to said substrate after said second exposing.

Claim 8 (Original) The method of Claim 1 wherein after each exposing step a purge gas is introduced to said substrate.

Claim 9 (Original) The method of Claim 1 wherein said first exposing comprises TaCl_5 and said second exposing comprises SiH_4 .

Claim 10 (Original) The method of Claim 1 wherein an evacuation step occurs between the first and second exposing.

Claims 11-30 (Cancelled)

Claim 31 (New) A method of forming a metallic silicide film comprising:
first exposing a substrate to a first flux of a Group IVB or VB metal precursor to form a condensed and absorbed monolayer or less of said metal precursor on a surface of the substrate;
introducing a hydrogen plasma to said substrate containing said metal precursor; and
second exposing the condensed and absorbed monolayer or less to a second flux of a silicon source to provide a metal silicide film, wherein said first and second exposing is performed at a substrate temperature of less than 450°C.

Claim 32 (New) The method of Claim 31 wherein the metal precursor is a halogen-containing Group IVB or VB compound of the formula MX_a wherein M is a Group IVB or VB metal, a is 4 or 5, and X is a halogen.

Claim 33 (New) The method of Claim 31 wherein the metal precursor is $TaCl_5$.

Claim 34 (New) The method of Claim 31 wherein the silicon source is a silane of the formula Si_nH_{2n+2} wherein n is from 1 to 10.

Claim 35 (New) The method of Claim 34 wherein the silane is SiH_4 .

Claim 36 (New) The method of Claim 31 wherein after each exposing step a purge gas is introduced to said substrate.

Claim 37 (New) The method of Claim 31 wherein said first exposing comprises $TaCl_5$ and said second exposing comprises SiH_4 .

Claim 38 (New) The method of Claim 31 wherein the metal silicide film has a graded composition.

Claim 39 (New) A method of forming a metallic silicide film comprising the steps of:
first exposing a substrate to a first flux of a Group IVB or VB metal precursor to form a condensed and absorbed monolayer or less of said metal precursor on a surface of the substrate;

second exposing the condensed and absorbed monolayer or less to a second flux of a silicon source, wherein said first and second exposing is performed at a substrate temperature of less than 450°C; and

introducing a hydrogen plasma to said substrate.

Claim 40 (New) The method of Claim 39 wherein the metal precursor is a halogen-containing Group IVB or VB compound of the formula MX_a wherein M is a Group IVB or VB metal, a is 4 or 5, and X is a halogen.

Claim 41 (New) The method of Claim 39 wherein the metal precursor is $TaCl_5$.

Claim 42 (New) The method of Claim 39 wherein the silicon source is a silane of the formula Si_nH_{2n+2} wherein n is from 1 to 10.

Claim 43 (New) The method of Claim 42 wherein the silane is SiH_4 .

Claim 44 (New) The method of Claim 39 wherein after each exposing step a purge gas is introduced to said substrate.

Claim 45 (New) The method of Claim 39 wherein said first exposing comprises $TaCl_5$ and said second exposing comprises SiH_4 .

Claim 46 (New) The method of Claim 39 wherein the metal silicide has a graded composition.